FU Tiller ROT

Operation Manual

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I. Preface

The Alphatron AlphaPilot MFM system is a type approved heading control system, designed to fit vessels of any size, including high speed crafts.

The FU Tiller ROT is part of the AlphaPilot MFM system and is used for steering in automatic steering mode. The FU Tiller ROT is typically used in combination with an AlphaPilot MFM control unit. The FU Tiller ROT allows the operator to steer in FU control mode or ROT control mode.

- Thoroughly read this operation manual before operating the equipment.
- We recommend keeping this manual nearby the equipment to ensure ready access to it.

Revision History

Revision No.	Date	Description	Author
1.0	18-04-2018	First release	J. Kreeft
1.1	05-10-2018	Various minor textual improvements (removed abbreviations, changed alert naming, added page numbering). 8: Added sound scheme	J. Kreeft

Glossary

The glossary contains a list of abbreviations and a list of definitions.

Abbreviations

Abbreviations as used in this manual are explained in the table below.

FU	Follow-Up
PS	Port Side
ROT	Rate of Turn
SB	Starboard Side
STBY	Standby

Definitions

The meaning of standard definitions as used in this manual are explained in the table below.

Alert	Announcement of abnormal situations and conditions requiring attention. Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions:
	- Emergency alarm:
	Highest priority of an alert. Alarms which indicate <u>immediate danger to human life or to the ship</u> and its machinery exits and require immediate action.
	- Alarm:
	An alarm is a high-priority alert. Condition <u>requiring immediate attention and action</u> by the bridge team, to maintain the safe navigation of the ship.
	- Warning:
	Condition <u>requiring immediate attention, but no immediate action</u> by the bridge team. Warnings are presented for precautionary reasons to make the bridge team aware of changed conditions which are not immediately hazardous, but may become so if no action is taken
	- Caution:
	<u>Lowest priority of an alert</u>. Awareness of a condition which does not warrant an alarm or warning condition, but still <u>requires attention</u> out of the ordinary consideration of the situation or of given information.
	An alert provides information about a defined state change in connection with information about how to announce this event in a defined way to the system and the operator.
	Alerts are separated for the alert handling into three categories of alerts:
	- Category A alerts:
	Alerts for which graphical information at the task station directly assigned to the function generating the alert is necessary, as decision support for the evaluation of the alert-related condition.
	- Category B alerts:

	Alerts where no additional information for decision support is necessary besides the information which can be presented at the CAM-HMI. - Category C alerts: Alerts that cannot be acknowledged on the bridge but for which information is required about the status and treatment of the alert, e.g., certain alerts from the engine.
AlphaPilot MFM	Alphatron brand name for the heading control system.
Autopilot	A Heading Control System.
Indication	Visual display of any message to the user which may be accompanied by a low intensity acoustic signal to gain attention.
Rate-Of-Turn	The speed (or rate) at which a ship, or vessel is turning at, or can turn at, measured in degrees per minute.
Steering mode selector	A switch provided for the selection of manual steering modes and automatic steering devices.
Tiller	A device that is used to turn the rudder, which then steers the boat.

II.   Safety Information

The signal words DANGER, WARNING and CAUTION used in this manual indicate the degree of hazard that may be encountered by the user. These words are defined as follows:

	DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.
	WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

The signal word NOTICE used in this manual indicates information considered important but not related to injury. It is typically used to prevent damage to equipment or property.

To safely operate this system, the following DANGERS, WARNINGS, and CAUTIONS must be adhered to. Failure to comply with the precautions or with specific dangers, warnings, and cautions elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment. ALPHATRON MARINE assumes no liability for the customer's failure to comply with these requirements.

	WARNING	Do not disassemble or modify the equipment. Otherwise, it may cause a fire, or you may suffer an electrical shock.
	WARNING	Immediately turn off the power and disconnect the power supply cable if the equipment is generating any smoke or odour or is overheated. Immediately inform your local service agent of the symptom to have it repaired. Prolonged equipment operation under such a condition can cause a fire or electric shock.
	WARNING	Do not place a container containing liquid on the equipment. Otherwise, it may cause a fire, or you may suffer an electrical shock if knocked over.
	WARNING	When unplugging the instrument, be sure to remove the cord terminal correctly. If the cord is pulled, the cord may get damaged resulting in a fire or an electrical shock.

III.   Warranty

To not to adversely affect the warranty, the following notices must be adhered to.

NOTICE	Operating personnel must not remove equipment covers. Only personnel trained and certified by ALPHATRON MARINE must make component replacement and internal adjustment.
NOTICE	Do not disassemble or modify the equipment. Failure to observe this instruction may cause equipment failure, and it will void the warranty.
NOTICE	Any modification to this equipment without prior written permission from ALPHATRON MARINE will void the warranty.
NOTICE	Installation of this product shall only be done by a certified installation company approved by either ALPHATRON MARINE or by an official ALPHATRON MARINE distributor. Acting otherwise will void the warranty.
NOTICE	This product contains no operator serviceable parts. Service and repair shall only be carried out by personnel trained and certified by ALPHATRON MARINE.
NOTICE	Do not place a container containing liquid on the equipment. The equipment can be damaged if knocked over.
NOTICE	When cleaning the surface, do not use any organic solvent such as thinner or benzine. Otherwise, the paint and markings on the surface may get damaged. For cleaning the surface, remove the dust and debris and wipe with a clean dry cloth.

1 Introduction

The FU Tiller ROT is part of the AlphaPilot MFM system and is used for steering in automatic steering mode. The FU Tiller ROT is typically used in combination with an AlphaPilot MFM control unit. The FU Tiller ROT allows the operator to steer in FU control mode or ROT control mode.

The FU Tiller ROT has 1 handle and multiple buttons:

- The alert speaker button will illuminate when there is an alert. The button is used to mute the speakers of the FU Tiller ROT and interconnected modules.
- Buttons **DIM -** and **DIM +** are used to control the brightness level of the FU Tiller ROT and interconnected modules.
- Button **FU** is used to release/take FU control.
- Button **ROT** is used to release/take ROT control.
- The handle is used to steer (step less control).

Figure 1: FU Tiller ROT

2 Enabling FU or ROT control

Push the button **FU** to enable FU control or push the button **ROT** to enable ROT control. The control mode indicator and handle indicator will illuminate, meaning that the respective mode is enabled, and that the handle is enabled.

*Note that control must be allowed, see subsection 'Control allowed/not allowed' on page 11. Note that another active controller may need to allow control handover first, see subsection 'Control handover' on page 12.

Figure 2: FU mode enabled

Figure 3: ROT mode enabled

2.1 Control allowed/not allowed

When not in control, the FU Tiller ROT is in standby mode and handle is disabled (control mode indicator **STBY** is illuminated and the handle indicator is not illuminated). The buttons **FU** and **ROT** are illuminated when allowed to take control (see Figure 4 & Figure 5).

FU and ROT control is steering in automatic steering mode; therefore, the Mode Switch must be in position **AUTO** (Mode Switch 3 Pos) or **AUTO|MAN** (Mode Switch 2 Pos).

FU or ROT control is not allowed when the Mode Switch is in position **NFU** or **MAN** (Mode Switch 3 Pos)).

Figure 4: Enabling FU or ROT control not allowed

Figure 5: Enabling FU or ROT control allowed

When a non-illuminated button is pushed, the speaker produces 4 short successive beeps to indicate that the operation is not valid.

2.2 Control handover

If applicable, handover of control must be allowed first by the active controller to allow the FU Tiller ROT to take control (i.e. enable FU control or ROT control).

The method for control handover is pre-set during commissioning. Two system settings are possible, namely 'Take control' or 'Release/take control'.

2.2.1 Take control

Any controller can take control. Control handover allowance is not applicable.

Procedure for FU Tiller ROT:

- Push the button **FU** to enable FU control or push the button **ROT** to enable ROT control. The control mode indicator and handle indicator will illuminate, meaning that the respective mode and the handle is enabled.

2.2.2 Release/take control

Any controller can take control, only when the active controller allows control handover.

Procedure for FU Tiller ROT:

- Take control
  Allow control handover from the active controller (refer to the respective operation manual for the procedure). Buttons **FU** and **ROT** will both illuminate to indicate that FU and ROT control is allowed. Push the button **FU** to enable FU control or push the button **ROT** to enable ROT control. The control mode indicator and handle indicator will illuminate, meaning that the respective mode and the handle is enabled.

- Release control
  To allow control handover to another controller, push the button **FU** or **ROT** (depending on which one is enabled), until the control mode indicator flashes (this indicates that control handover is allowed).
  NOTE: The FU Tiller ROT stays in control until control is transferred to another controller.
  NOTE: The control mode indicator keeps flashing until control is transferred to another controller. There is no timeout. The speaker produces one second beeps with one second interval to indicate that the operation is not finished. There is no timeout.
  NOTE: The FU Tiller ROT goes into standby mode when control is transferred to another controller.

3 Steering

In FU control, the steering gear will move the rudder as per FU value command (rudder angle). Moving the handle to the neutral position will cause the rudder to move to the centre position. Turning the handle farthest to the left will cause the rudder to move to a predefined maximum rudder angle, turning the handle farthest to the right will cause the rudder to move to the predefined maximum rudder angle in the opposite direction.

In ROT control, the steering gear will move the rudder as per ROT value command. The ROT value in relation the handle position is pre-set, moving the handle to the middle position will result in a ROT value of zero.

4 Alert handling

The alert speaker button is only illuminated when there is an internal alert. When an alert occurs, the alert speaker button will flash in an uninterrupted sequence, and the speaker will beep in an uninterrupted sequence (see Figure 7: Sound scheme for Alerts).

Figure 6: Alert active

The alert speaker can be muted via the alert speaker button.

When the alert (is read and) acknowledged on the AlphaPilot MFM control unit, then the illumination will be constant, and the speaker will be muted (if not muted already via the FU Tiller ROT). When the alert is accepted (e.g. problem solved), then the illumination on the alert speaker button will turn off.
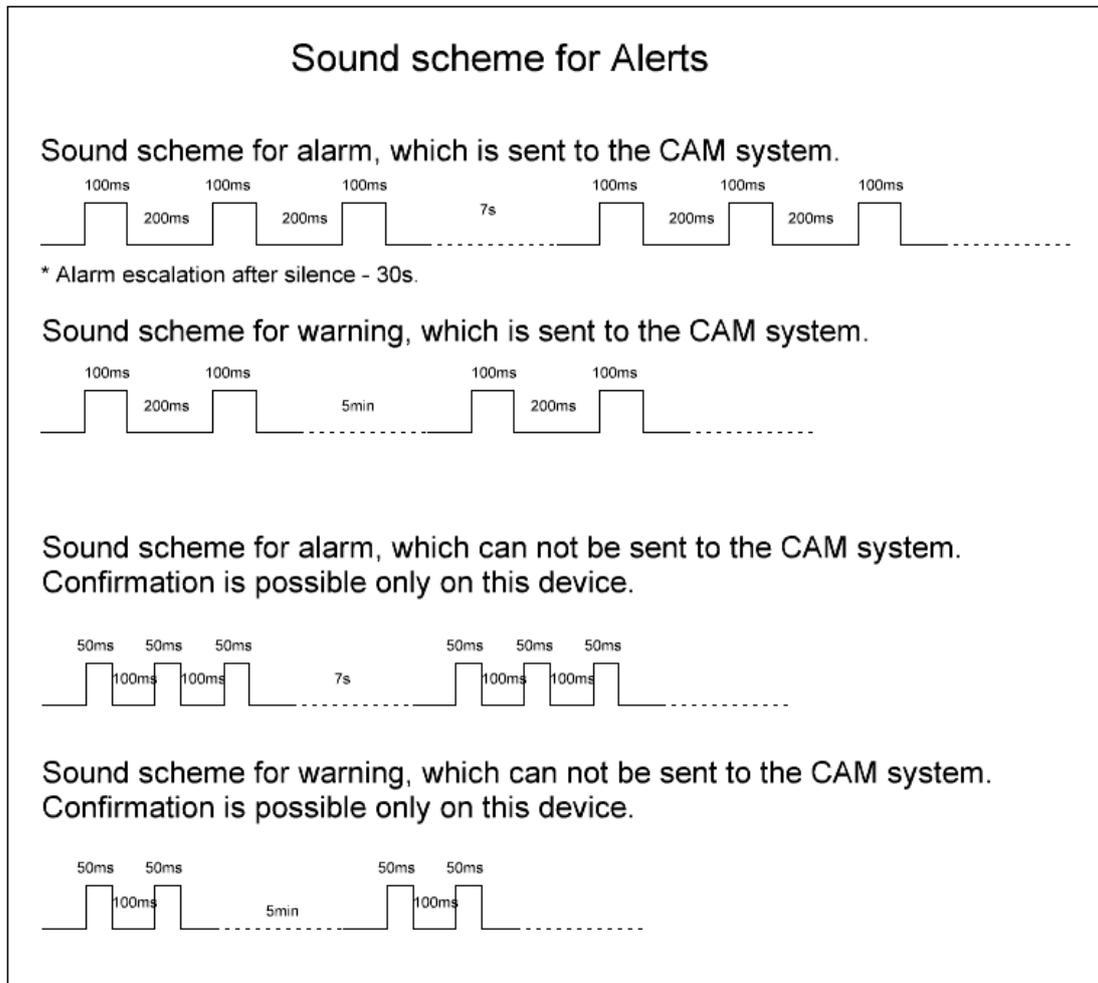
Figure 7: Sound scheme for Alerts

5 Dimming

Buttons **DIM -** and **DIM +** are always illuminated (dimmed to a pre-set brightness level) and control is always allowed.

Push the button **DIM -** or **DIM +** to simultaneously adjust the brightness level of all indicators on the FU Tiller ROT and interconnected modules.

6 Alert speaker and lamp test

Simultaneously push and hold button **DIM -** and **DIM +** to test the alert speaker and the indicators; The alert speaker will beep continuously and all indicators (buttons, control mode indicators, and handle indicator) will illuminate continuously, until the buttons are released.